



US Army Corps  
of Engineers  
Waterways Experiment  
Station

# The CERCUlar

## Coastal Engineering Research Center

Vol CERC-95-4

December 1995

## The Economic Value of Beaches

by James R. Houston, Director, Coastal Engineering  
Research Center

Travel and tourism is America's leading industry, employer, producer of new jobs, and earner of foreign exchange; and beaches are the leading factor in travel and tourism. Few in America realize that beaches are a key driver of America's economy and its competition in a world economy. Without a paradigm shift in attitudes toward the economic significance of travel and tourism and necessary infrastructure investment to maintain and restore beaches, the United States will relinquish a dominant worldwide lead in its most important industry.

### Travel and Tourism in the U.S.

#### Important industry

Service industries such as travel and tourism are becoming increasingly dominant in economies of developed countries. Few realize that travel and tourism is already America's largest industry, employer, creator of new jobs, and earner of foreign exchange; and beaches are the largest factor in travel and tourism. Although computers, information highways,

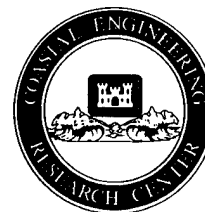
and other high-tech industries grab the news, travel and tourism has provided the economic growth, jobs, and foreign exchange that make the United States increasingly competitive in a world economy. These contributions have gone largely unnoticed, although John Naisbitt's recent book *Global Paradox* (Naisbitt 1994) notes travel and tourism's critical role in modern economies.

Travel and tourism is the largest industry in the United States and world, with worldwide revenues of \$2.9 trillion (Miller 1993). Only the U.S. has a Gross National Product exceeding this. Travel and tourism contributes \$746 billion to America's Gross Domestic Product (GDP) (*Wall Street Journal* 1995). This is over 10 percent of U.S. output, and makes travel and tourism the second largest contributor to the GDP, just behind combined wholesale and retail trade (*Wall Street Journal* 1995) (or the largest contributor with wholesale and retail trade separated). Travel and tourism also produced \$58 billion in tax revenue in 1994 (Borcover 1995).

#### Job market

Travel and tourism is by far America's largest employer, employing 14.4 million people (*Wall Street Journal* 1995). In contrast, all U.S. manufacturing industries, from IBM to General Motors to Intel, employ only 18 million people (*World Almanac* 1994). In addition, travel and tourism employment is increasing rapidly, whereas manufacturing employment is declining. Over the past year, tourism-related jobs increased by 343,000 (*Business Week* 1994). This has more than compensated for an annual decline over the past decade of 200,000 manufacturing jobs due to manufacturing-productivity increases.

The rapid increase in travel and tourism jobs and decline in traditional manufacturing is largely unrecognized by local and state governments that still compete for a piece of the shrinking pie by trying to attract manufacturing. Their efforts often target high-technology industries that are reducing employment as rapidly as other manufacturing industries. Even Florida, with remarkable competitive advantages in travel and tourism, concentrates on attracting high-technology industries. Part of this benign neglect of travel



DTIC QUALITY INSPECTED 4

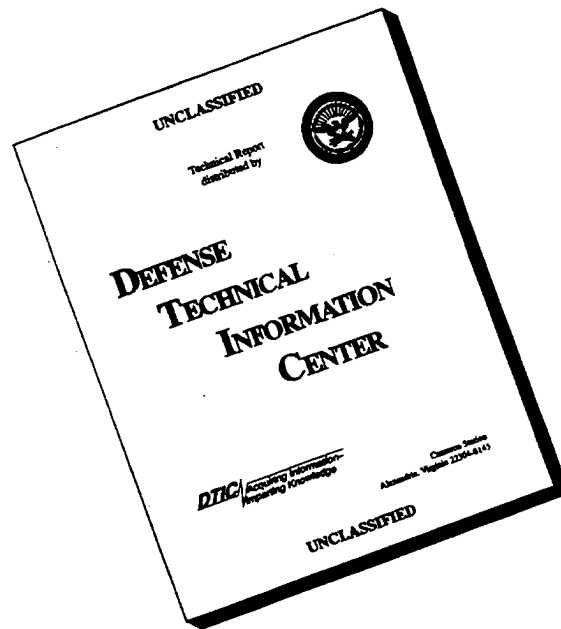
DISTRIBUTION STATEMENT A

Approved for public release

Distribution Unlimited

19960213 034

# DISCLAIMER NOTICE



**THIS DOCUMENT IS BEST QUALITY AVAILABLE. THE COPY FURNISHED TO DTIC CONTAINED A SIGNIFICANT NUMBER OF PAGES WHICH DO NOT REPRODUCE LEGIBLY.**

and tourism may be due to perceptions that this industry has low-wage jobs. However, per-capita wages for travel and tourism jobs average \$34,300, slightly ahead of average U.S. industry wages (*Wall Street Journal* 1995). Switzerland provides a good example of high wages in tourism, since it depends on tourism more than any developed country, yet has one of the world's highest per-capita incomes.

## International factor

Travel and tourism also plays a key role in international competitiveness, since it is the largest and fastest growing segment of a U.S. service-industry trade surplus (the United States still runs a large merchandise trade deficit). Foreign visitors are expected to generate a \$26-billion trade surplus in 1995 versus a surplus of \$17 billion in 1992 and a deficit of \$7 billion in 1986 (*Wall Street Journal* 1993, 1995). This surplus is greater than the entire U.S. trade surplus for agricultural exports. Travel and tourism also earns more foreign exchange than any industry. Foreign tourists to the U.S. spent about \$80 billion in 1994 (*Business Week* 1994). This spending is almost equal to the combined export value of U.S. agricultural commodities, computers, and airplanes (*World Almanac* 1994).

## Importance of Beaches

### Economic impact

The waning importance of manufacturing and increasing economic importance of travel and tourism is illustrated by the steel industry. In the early 1960s, a dispute between the Kennedy Administration and the steel industry over price increases contributed to

the economy sliding into recession. Today the relative decline in economic importance of the steel industry makes a similar event unlikely. Instead, news of drive-by shootings of foreign tourists is likely to have greater economic impact than steel-price increases, since spending by foreign tourists supports about 10 times more jobs than the steel industry (*World Almanac* 1994, *Business Week* 1994). The United States no longer dominates the world steel industry, but it does dominate worldwide travel and tourism, receiving over 45 percent of the developed world's travel and tourism revenues and 60 percent of its profits (*Wall Street Journal* 1994).

Beaches are the key element of U.S. tourism, since they are the leading tourist destination with historical sites and parks being the second most popular; other destination choices are minor by comparison (*USA Today* 1993). Coastal states receive about 85 percent of tourist-related revenues in the United States, largely because beaches are tremendously popular (*World Almanac* 1994). Although there are many interior attractions from Yellowstone to the Grand Canyon and from Las Vegas to Branson, MO, the popularity of beaches dominates tourism.

For example, a single beach location, Miami Beach, reported more tourist visits (21 million) than were made to any National Park Service property (Wiegel 1992). Miami Beach has more tourist visits than twice the combined number of tourist visits to Yellowstone (2.6 million), the Grand Canyon (4.0 million), and Yosemite (3.3 million) (*World Almanac* 1994). Miami Beach alone had more than a third the number of recreation visits made to all Bureau of Land Management

public lands (270 million acres) (*World Almanac* 1994).

There are likely more recreation visits to beaches than to lands of the National Park Service and Bureau of Land Management combined. Beaches are America's playland and economic heartland, with beach tourism contributing about \$170 billion annually to the economy (Houston 1995). And the number one concern about beaches among Americans who visit them is beach erosion (Hall and Staimer 1995).

## Foreign competition

Travel and tourism's importance to world economies, employment, and international competitiveness has not been lost on America's economic competitors. For example, Japan has created a gigantic indoor beach to attract tourists to year-around enjoyment of beach ambience.

Germany and Japan have outspent the United States in infrastructure investment for decades, including spending freely to maintain their beaches as infrastructure investments. Germany has spent about \$3.3 billion over 40 years on shore protection (Kellett 1992). This is about five times corresponding U.S. expenditures over the same period and about 25 to 50 times a greater share of the GDP (Houston 1995). These expenditures were made to protect a coastline less than 5 percent the length of the U.S. coast. Japan's budget for shore protection and restoration has topped \$1.5 billion in a single year (Marine Facilities Panel 1991). This is more spent in a single year than the United States has spent in over 40 years (U.S. Army Corps of Engineers 1994).

Spain, with its extensive beaches, is a major competitor for tourists. It is conducting a 5-year program to both restore existing

beaches and build new ones that outspends all U.S. beach-restoration efforts of the past 40 years (Ministerio de Obras Publicas y Transportes 1993). Of course, tourism is the dominant and critical industry in Spain. Even so, Spain's tourist revenues are only about 7 percent of those of the United States (*World Almanac* 1994).

## Investment in Beaches

### Past record

Over the past four decades, the United States has spent only \$15 million annually on shore protection and restoration (\$34 million in 1993 dollars) (U.S. Army Corps of Engineers 1994). This compares with annual subsidies of \$61 million for mohair (mohair value of \$13 million), \$134 million for wool (\$53 million value), and \$199 million for rice production in a single state (Houston 1995). Spending on beach restoration has been less than 0.1 percent of U.S. spending for crop subsidies or foreign aid.

### Miami Beach experience

Beach nourishment at Miami Beach is a good example of the economic benefits of beach restoration. Miami Beach had virtually no beach by the mid-1970s. As a result, facilities were run-down, and Miami Beach was not the place to visit. Beach nourishment in the late 1970s rejuvenated Miami Beach and opened its beach to the public. Beach attendance, based on lifeguard counts and aerial surveys, increased from 8 million in 1978 to 21 million in 1983 (Wiegel 1992).

Miami Beach now has over 2 million foreign visitors who spend more than \$2 billion annually (Cobb 1992). Annual foreign reve-

nue alone is about 40 times the \$52-million cost of this beach-nourishment project that has lasted over 15 years. The capitalized project cost just over its current life is about \$3 million per year.

With foreign revenue of \$2 billion a year at Miami Beach, every \$1 invested annually to nourish the beach returns \$700 annually in foreign exchange. This compares with a return of little more than \$1 in agricultural-trade surplus for each \$1 of crop subsidy. If the Miami Beach experience of a \$700 return in foreign exchange for every \$1 invested in beach renourishment were successfully repeated through beach restorations around the United States, an investment of less than 1 percent of the annual crop subsidy or foreign-aid spending would wipe out most of the U.S. trade deficit of over \$100 billion.

## Spread the Word!

Abundant natural attractions, including the world's most extensive beaches, make the United States attractive to tourists. However, there is a world economy in tourism that gives consumers ample choices and produces stiff worldwide competition for tourists. If beaches in Florida become run-down, German tourists can choose Spanish beaches. If Hawaiian beaches decline, Japanese tourists can choose Australia's Gold Coast. This worldwide competition is well-recognized outside the United States. For example, Australia has established a cabinet-level tourism minister to aid competition for foreign tourists (Carroll 1992). Canada recently launched a \$99-million ad campaign to attract tourists. In contrast, the U.S. spends just \$16.3 million advertising tourism to its international tourist markets

(Sharp 1995). The U.S. ranks 31st in tourism advertisement, with Spain spending almost 10 times as much as the United States (*Washington Post* 1995). There are signs that the United States is starting to lose in the international competition for tourists. The United States has lost 16 percent of its market share of international tourists over the past two years. If the United States had simply maintained its share of 2 years ago, 170,000 more Americans would be employed today.

*Note: This article is an update of a paper presented in Shore and Beach in January 1995 (Houston 1995).*

## References

- Borcover, A. (1995). "The travel industry convenes for White House conference," *Washington Post*, October 30, 1995, C1.
- Business Week*. (1994). "Oh say can we spend? A weak dollar is luring tourists to the U.S. in droves," August 22, 1994, 30-31.
- Carroll, D. (1992). "Tourism gets little respect, travel council says," *USA Today*, March 31, 1992, 2B.
- Cobb, C. E., Jr. (1992). "Miami," *National Geographic* 181(1), 86-113.
- Hall, C., and Staimer, M. (1995). "Concerns about the coast," *USA Today*, August 9, 1995, 1A.
- Houston, J. R. (1995). "Beach nourishment," *Coastal Forum, Shore and Beach*, January 1995, 21-24.
- Kelletat, D. (1992). "Coastal erosion and protection measures at the German North Sea coast," *Journal of Coastal Research*, 8(3), 699-711.
- Marine Facilities Panel. (1991). *U.S. Japan Wind and Seismic Effects Panel, 17th Joint Meeting*, Tokyo, Japan, J-(4), 1-9.
- Miller, M. L. (1993). "The rise of coastal and marine tourism,"

- Ocean and Coastal Management* 20, 181-199.
- Ministerio de Obras Publicas y Transportes. (1993). "Recuperando la costa," Serie Monografias, Centro de Publicaciones, Madrid, Spain.
- Naisbitt, J. (1995). *Global paradox*. First Avon Books, Avon, NY.
- Sharp, D. (1995). "Fewer Canadians heading south for winter," *USA Today*, March 13, 1995, 11A.
- U.S. Army Corps of Engineers. (1994). "Shoreline protection and beach erosion control study; Phase I: Cost comparison of shoreline protection projects of the U.S. Army Corps of Engineers," Washington, DC.
- USA Today*. (1993). "More plan vacations this year," March 17, 1993, D1.
- U.S. Travel and Tourism Administration. (1995). "Travel trade surplus," Press release on Internet World Wide Web, [doc.gov/resources/ustta/releases/prsurplu.html](http://doc.gov/resources/ustta/releases/prsurplu.html).
- Wall Street Journal*. (1993). "Quiet boom, U.S. service exports are growing rapidly but almost unnoticed," April 21, 1993, A1.
- Wall Street Journal*. (1994). "The other American dream team," February 15, 1994.
- Wall Street Journal*. (1995). "Travel, tourism will produce 10.5% of U.S. output this year, study says," March 1, 1995, A8.
- Washington Post*. (1995). "Chefs bemoan a reduction in their favorite deduction," April 11, 1995, D4.
- Wiegel, R.L. (1992). "Dade County, Florida, beach nourishment and hurricane surge study," *Shore and Beach* 60 (4), 2-26.
- World Almanac*. (1994). Funk & Wagnalls Corp., Mahwah, NJ.

## Coastal Engineering Research Board Civilian's Meeting

The Coastal Engineering Research Board (CERB) President, Major General Stanley G. Genega, previously announced a new format for CERB meetings. The spring meeting will continue to be a full meeting of the Board, while the fall meeting is a meeting of the civilian members, hosted by a military member. The fall meeting format allows the civilian members to have a better understanding of the workings and problems of the host Division. Brigadier General Ralph V. Locurcio, Commander, South Atlantic Division (SAD), recently hosted the civilian members. Shown in the photo are Dr. G. Edward Dickey, Chief of Planning, Headquarters, U.S. Army Corps of Engineers; Dr. William E. Roper, Research and Development Directorate; and CERB members Dr. Paul D. Komar, Dr. Edward K.



Noda, Brigadier General Locurcio, and Dr. Robert G. Dean. They are shown in front of the Scanning Hydrographic Operational Airborne Lidar Survey (SHOALS) helicopter that had just conducted

rapid surveys for SAD in the aftermath of Hurricane Opal. The group flew on the helicopter for a demonstration of the SHOALS system.

# The Corps Coastal Engineering Vision

At the direction of MG Stanley G. Genega, President of the Coastal Engineering Research Board (CERB), a task force headed by CERB members BG (P) Milton Hunter and Dr. Robert G. Dean, University of Florida, was formed to study coastal engineering challenges the Corps will meet moving into the 21st century. The task force report was recently approved by

MG Genega and will be the topic of articles in future editions of the CERCular.

The task force saw the need and developed a vision statement for the Corps' involvement in coastal engineering. The Corps vision statement is:

**We will, as the National Coastal Engineer:**

- Continue our leadership in the protection, optimization, and enhancement of the Nation's coastal zone resources.
- Increase our contribution to the Nation's economy, quality of life, public safety, and environmental stewardship.

## Publications of Interest

The following publications are available from the sources indicated. They are not available from CERC.

*Mechanics of Coastal Sediment Transport*, 369 pages, 1992, hard cover \$67, paperback \$32, and *Coastal Bottom Boundary Layers and Sediment Transport*, 324 pages, 1992, hard cover \$64, paperback \$32, MasterCard, Visa, American Express, and Diners Club accepted. Copies available from World Scientific Publishing Co., Inc.,

1060 Main Street, River Edge, NJ 07661, 1-800-227-7562, FAX (201) 487-9656.

*Science, Policy, and the Coast: Improving Decisionmaking*, 85 pages, 1995, paperback, \$27, *Environmental Science in the Coastal Zone*, 184 pages, 1994, paperback, \$40, and *Restoring and Protecting Marine Habitat*, 212 pages, 1994, paperback, \$30. Copies available from the National Academy Press, Washington, DC, 1-800-624-6242.

*An Introduction to Coastal Zone Management*, 220 pages, 1994, hard cover \$49, paperback, \$29.95, and *Wetlands - An Approach to Improving Decision Making in Wetland Restoration and Creation*, 176 pages, 1992, hard cover, \$40, MasterCard, Visa, and American Express accepted. Copies available from Island Press, Box 7, Covelo, CA 95428, 1-800-828-1302, FAX (707) 983-6414.

## DRP on the Road

The Dredging Research Program (DRP) went on the road this summer to seven Corps of Engineers Districts in the south and southwest to inform the Districts and the dredging community of DRP products and their

availability. Audiences ranged up to 40 attendees and consisted of District personnel and members of the dredging community from other government entities and the private sector. Districts visited included Jacksonville, FL;

Savannah, GA; Mobile, AL; New Orleans, LA; Galveston, TX; Wilmington, NC; and Norfolk, VA. Point of contact for information is Terri L. Prickett at (601) 634-2337 or E-mail: t.prickett@cerc.wes.army.mil.

## Election to Office

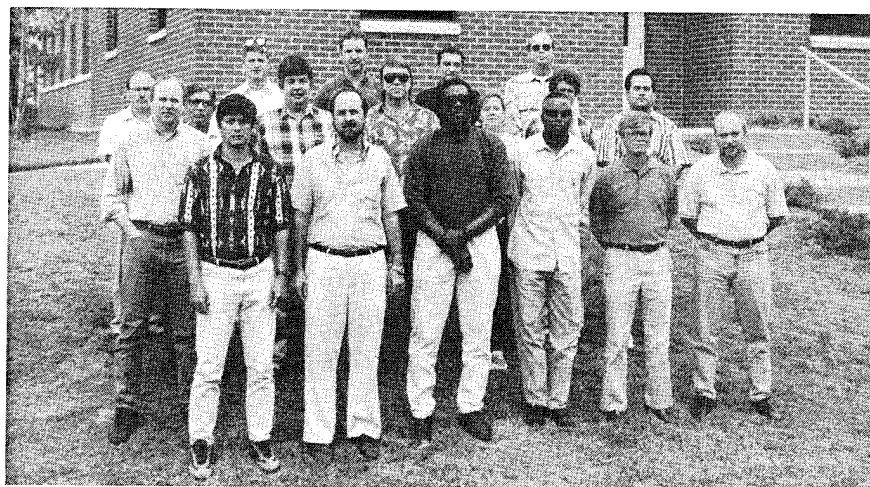
Mary A. Cialone, a research hydraulic engineer in the Coastal Processes Branch, Coastal Engineering Research Center, was recently elected as President-Elect, Vicksburg Branch, Mississippi Section, American Society of Civil Engineers. She joined

CERC in 1982 and is presently a Joint Principal Investigator for the Coastal Inlets Research Program work unit, "Inlet Sedimentation," and a Joint Principal Investigator for the Monitoring Completed Coastal Projects work unit, "Barnegat Inlet, New Jersey."

She received a Bachelor of Civil Engineering degree from the University of Delaware in 1982, and an M.S. in Civil Engineering from Mississippi State University in 1986. Ms. Cialone is a Registered Professional Engineer in the State of Mississippi.

# Coastal Engineering Courses

The Coastal Engineering I and II PROSPECT courses were conducted at the U.S. Army Engineer Waterways Experiment Station (WES) on 16-20 October and 23-27 October 1995. Attendees in the two courses were from Corps of Engineers Headquarters, Division, and District offices, the U.S. Coast Guard, and the Panama Canal Commission. Coastal Engineering I emphasizes coastal processes, including waves and sediment motion, while Coastal Engineering II emphasizes coastal structures. Tours of active models at the WES Coastal Engineering Research Center were included in each session. POC for information on coastal engineering courses is Dr. Yen-Hsi Chu, (601) 634-2067 or E-mail [y.chu@cerc.wes.army.mil](mailto:y.chu@cerc.wes.army.mil).



## Coastal Engineering Education Program

The next session of the Coastal Engineering Education Program (CEEP) will be held during the 1996-97 academic year starting in August 1996. The CEEP is a one-year program, offered jointly by Texas A&M University (TAMU) and the U.S. Army Engineer Coastal Engineering Research Center (CERC), through the Graduate Institute at the U.S. Army Engineer Waterways Experiment Station (WES). The CEEP allows participants to earn a

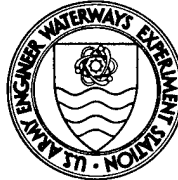
Master of Engineering degree with a concentration of courses in coastal engineering. The program is not limited to Corps employees and is open to all students meeting TAMU entrance requirements. The first semester is in residence at TAMU, and the second semester and following summer are at CERC. Students may alternatively enroll in the Master of Science degree program, which has slightly different requirements. For more information contact

Dr. C. H. Pennington, Director, WES Graduate Institute, 3909 Halls Ferry Road, Vicksburg, MS 39180-6199, telephone (601) 634-3549, FAX (601) 634-4180, or either Dr. Billy L. Edge or Dr. Robert E. Randall, Ocean Engineering Program, Texas A&M University, College Station, TX 77843-3136, telephone (409) 847-8712 or 845-4515, FAX (409) 862-1542.

# Calendar of Coastal Events of Interest

- Feb 12 - 16, 1996      **AGU/ASLOS Ocean Sciences Meeting**, San Diego, CA, POC: Dr. Suzette Kimball, (404) 331-4916, FAX (404) 331-4943, E-mail: [suzette\\_kimball@nps.gov](mailto:suzette_kimball@nps.gov)
- Apr 1 - 2, 1996        **Tsunami 1996**, Hilo, HI, POC: Tsunami Society, P.O. Box 25218, Honolulu, HI 96825, E-Mail: [gcurtis@uhunix.uhcc.hawaii.edu](mailto:gcurtis@uhunix.uhcc.hawaii.edu)
- May 6 - 9, 1996        **Offshore Technology Conference**, Houston, TX, POC: FAX (214) 952-9435, Internet: [tech-prog@spelink.spe.org](mailto:tech-prog@spelink.spe.org)
- May 6 - 10, 1996       **European Geophysical Society XXI General Assembly**, The Hague, The Netherlands, POC: E-mail: [egs@linax1.dnet.gwdg.de](mailto:egs@linax1.dnet.gwdg.de)
- Jun 11 - 14, 1996      **Western Dredging Association, WEDA XVII, and 29th Annual Dredging Seminar**, New Orleans, LA, POC: Dr. Robert E. Randall, (409) 845-4568, FAX: (409) 862-1542 or 845-6156
- Jun 17 - 22, 1996      **Seventh Pacific Congress on Marine Science and Technology, PACON '96**, Ilikai Hotel, Honolulu, HI, FAX: (808) 956-2580, E-mail: [pacon@wiliki.eng.hawaii.edu](mailto:pacon@wiliki.eng.hawaii.edu)
- Jun 19 - 22, 1996      **1996 World Congress on Coastal and Marine Tourism**, Ilikai Hotel, Honolulu, HI, E-mail: [auyongj@ccmail.orst.edu](mailto:auyongj@ccmail.orst.edu)
- Jul 14 - 17, 1996      **Coastal Society 15th International Conference**, Seattle, WA, POC: Megan D. Bailiff, E-mail: [mbailiff@u.washington.edu](mailto:mbailiff@u.washington.edu), Homepage: [http://www.wsg.washington.edu/conferences/coastal\\_society.html](http://www.wsg.washington.edu/conferences/coastal_society.html)
- Jul 21 - 26, 1996      **Hazards '96**, Toronto, Canada, POC: M. I. El-Sabh, FAX (418) 724-1842, E-mail: [mohammed\\_el\\_sabh@uqar.quebec.ca](mailto:mohammed_el_sabh@uqar.quebec.ca)
- Jul 29 - Aug 2, 1996    **Pan Pacific Hazards '96**, Vancouver, British Columbia, Canada, FAX (604) 822-6164, E-Mail: [dprc@unixg.ubc.ca](mailto:dprc@unixg.ubc.ca)
- Aug 12 - 17, 1996      **Coastal Zone Canada '96**, Rimouski, Quebec, Canada, POC: M. I. El-Sabh, FAX (418) 724-1842, E-mail: [mohammed\\_el\\_sabh@uqar.quebec.ca](mailto:mohammed_el_sabh@uqar.quebec.ca)
- Aug 13 - 16, 1996      **PORSEC '96, Pacific Ocean Remote Sensing Conference**, Victoria Conference Centre, Victoria, BC, Canada, FAX (604) 363-6479, ATTN: PORSEC '96, E-mail: [porsec96@ios.bc.ca](mailto:porsec96@ios.bc.ca)
- Sep 1 - 6, 1996        **25th International Conference on Coastal Engineering**, Peabody Hotel, Orlando, FL, POC: ICCE '96, (512) 994-2376, FAX (512) 994-2715, Internet: [icce96@cbi.tamucc.edu](mailto:icce96@cbi.tamucc.edu)
- Dec 2 - 6, 1996        **Natural and Technological Coastal Hazards**, Tirupati, AP, India, POC: Dr. C. Rajasekara Murthy, FAX (905) 336-4989/6230





## The CERcular Coastal Engineering Research Center

This bulletin is published in accordance with AR 25-30 as an information dissemination function of the U.S. Army Engineer Waterways Experiment Station. The publication is part of the technology transfer mission of CERC. Results from ongoing research programs will be presented. Special emphasis will be placed on articles relating to application of research results or technology to specific project needs. Contributions of pertinent information are solicited from all sources and will be considered for publication. Communications are welcomed and should be addressed to the Coastal Engineering Research Center, ATTN: Dr. Fred E. Camfield, U.S. Army Engineer Waterways Experiment Station, 3909 Halls Ferry Road, Vicksburg, MS 39180-6199, or call (601) 634-2012, FAX (601) 634-3433. Internet: f.camfield@cerc.wes.army.mil.

ROBERT W. WHALIN, PhD, PE  
Director

DEPARTMENT OF THE ARMY  
WATERWAYS EXPERIMENT STATION, CORPS OF ENGINEERS  
3909 HALLS FERRY ROAD  
VICKSBURG, MISSISSIPPI 39180-6199  
OFFICIAL BUSINESS  
CEWES-CV-1

BULK RATE  
U.S. POSTAGE PAID  
Vicksburg, MS  
Permit No. 85